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Applicant: HANS BRUDER  
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Sub Spec  
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11-13-02

SUBMISSION OF SUBSTITUTE SPECIFICATION


Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Attached is a Substitute Specification and a marked-up copy of the original specification. I certify that said substitute specification contains no new matter and includes the changes indicated in the marked-up copy of the original specification.

Respectfully submitted,

June 7, 2002



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## SUPPORTING PROFILE

## BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to a supporting profile for a system for erecting structures such as for fairs, exhibits or stores a generic system of this type is conventionally provided with longitudinally extending exterior grooves for connecting additional supporting profiles or structural parts of the construction system. In a core area, a receiving chamber for a turnbuckle is provided, being integrated into a first adapter piece which is inserted in guides pointing toward the interior of the supporting profile, and held axially by means of securing devices which are inserted in bores penetrating the guides.

A supporting profile of this type disclosed in German Patent Document DE-U 298 21 204 has a hollow profile, into which an adapter piece is in each case inserted and axially fastened on the faces. The adapter piece has axially extending chambers for receiving at least one turnbuckle which, in turn, can be utilized for fastening such supporting profiles on externally extending grooves of additional supporting profiles of the same or a similar type on the face side.

Supporting profiles of this type have a relatively low weight because they are provided with the adapter pieces only on their faces and otherwise remain hollow.

For fair and exhibition constructions, as well as for store constructions, it is often desirable to have structures are often desirable which require an angular arrangement of supporting profiles with respect to one another. This is not

possible in the case of the supporting profile of the above-mentioned type. Other known supporting profiles also can not easily be used for the desired constructions.

It is therefore an object of the present invention to further develop supporting profiles of the initially mentioned type such that additional uses are possible or that well-designed further developments can be achieved.

To achieve this object, in the case of a supporting profile of the initially mentioned type, an end disk, which is adapted to the cross-section of the supporting profile, is provided on at least one open face of the supporting profile and is connected with the adapter piece. This results in a simple embodiment.

In a further development of the invention, the end disk may be constructed as a formed body with a concave recess which is adapted to the external curvature of a round profile. The face-side mutual connection of round profiles can take place in this manner without unattractive gaps and without the requirement of cumbersome work of inserting adapting pieces during the assembly. The end disks are fixedly disposed on the face of the assigned supporting profile. As a further development of this embodiment, the formed body may also be provided with a passage opening for guiding through a turnbuckle which will then permit the fastening of the supporting profile on the external grooves of another profile. The turnbuckle is axially held in the interior of the supporting profile by the initially mentioned adapter piece. It was found in this case that the turnbuckle can also be utilized for holding the end disk on the face of the supporting profile. When the turnbuckle is placed in an external

groove of another profile, by means of this tensioning operation, the end disk is simultaneously also fixedly clamped in. Therefore, a separate fastening of the end disk on the face will only become necessary when the assigned supporting profile accommodates no turnbuckle.

As a further development of the invention, the end disk may also be provided with a joint part for connection with additional profiles. The joint part may include a disk which extends perpendicular to the end disk and has a center bore. The joint part may include a second disk which is connected with the first disk by means of a bolt acting as an axis of rotation and which is equipped with fastening devices for another profile. When the second disk is connected with another end disk, this embodiment will permit the joint-type joining of the faces of two supporting profiles.

As a further development of the invention, the second disk is provided with a clamping part for the insertion into one of the longitudinally extending grooves of another supporting profile allowing the articulated connection of a supporting profile to the longitudinal side of a first profile.

As a further development of the invention, in order to attractively cover the outside of the disks serving as a joint, hemispheres can be provided for the lateral covering of the disks. These hemispheres, as a further development of the invention, have a center bore with a thread and by means of this thread are screwable upon a thread at the ends of the bolt penetrating the disks.

The invention is illustrated in the drawing by means of embodiments and will be explained in the following.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a perspective partial view of further developed supporting profiles according to the invention which are mutually connected by way of a joint;

Figure 2 is an exploded view of the arrangement according to Figure 1;

Figure 3 is a view of one of the end disks used in the embodiment according to Figure 1;

Figure 4 is a face-side view of one of the supporting profiles according to Figures 1 and 2;

Figure 5 is a view of a clamping piece for the connection with an end disk according to Figure 3 for a fastening to an external groove of a supporting profile;

Figure 6 is a view of the insert of the clamping piece of Figure 5 for the articulated arrangement of two profiles;

Figure 7 is a view of the supporting profiles according to the invention similar to Figure 1 but with a square cross-section;

Figure 8 is a representation similar to Figure 6 but with supporting profiles with a square cross-section;

Figure 9 is a perspective partial view of three supporting profiles with a round cross-section which are assembled to form a junction point;

Figure 10 is a schematic sectional view of the junction point according to Figure 9;

Figure 11 is a view of one of the end disks used for assembling the profiles according to Figures 9 and 10; and

Figure 12 is a lateral view of the end disk according to Figure 11.

#### DETAILED DESCRIPTION OF THE DRAWINGS

Figures 1 to 4 show a first embodiment of the invention. Here, two supporting profiles 1 each have a round cross-section and, on their outer circumference, longitudinally extending grooves 2. At their open front ends, the supporting profiles each have a slid-in adapter piece 3 which is held in the axial position by screws 4 laterally inserted into the corresponding openings. This adapter piece 3 is utilized for fastening an end disk 5 on the face side of the supporting profile 1 by means of screws 6 which are threaded in the threaded openings 7 of the adapter piece 3. A lug having an end in the shape of a disk 9 is fastened on the end disk 5 and extends perpendicularly from the disk surface. The disk 9, as illustrated particularly in Figure 3, is provided with a center bore 10. A bolt 11, threaded at least at one of its two ends, is guided through the center bores 10 of the disk-type ends 9 of both end disks 5, connecting the end disks 5 in a mutually rotatable manner. The end disks 5 are each mounted in the above-described manner on the face side on the supporting profiles 1. Nuts 12 hold the two disks 9 against one another. In order to permit a tool-less assembly, butterfly nuts instead of the nuts 12 may be used in this case. The disks are then, for aesthetic reasons, covered on the outside by hemispheres 13 respectively. Each hemisphere is screwed onto the thread of the respective bolt 11 by means of a threaded part 14 provided in the hemisphere 13. The

arrangement according to Figure 1 therefore permits the articulated joining of two supporting profiles in each case by the arrangement of end disks.

Figures 5 and 6 show a variant of the embodiment shown in Figure 1. In Figures 5 and 6, the disk 9 of an end disk 5', which has a smaller diameter than the end disks 5 of Figures 1 to 4, is connected with a disk body 15 (Figure 5) whose attachment 16 is not fastened to an end disk. The attachment 16 interacts with a clamping piece 17 which, by way of a screw guided through the bores 18 and a pertaining nut 20, is held on the lug 16 so that it can be swivelled from side to side. Two clamping screws 21 are inserted into threaded bores 22 of the clamping piece 17 and can, in each case, press the free edge 17a of the clamping piece away from the free edge 16a. The free edge 16a has an elevation projecting toward the outside, so that, as illustrated by Figure 6, the clamping piece is first slid into the open side of the groove 2 and is then laterally spread open, so that the parts 17 and 16 are jammed inside the groove. In the embodiment of Figure 6, the supporting profiles 1 and 1', which have different diameters, can thereby be connected in an articulated manner.

Figures 7 and 8 show embodiments similar to those of Figures 1 and 6, but the supporting profiles 1a and 1a' each have a square cross-section and, for this reason, the end disks 5a each also have a square construction. In this case, the supporting profile 1a' has smaller dimensions. Otherwise, the construction of the joint itself corresponds to that of Figures 1 and 2 or to the further development according to Figures 5 and 6. It is also possible to combine the end disks 5a or 5a' having the square cross-section with end disks 5 or 5' by way of a joint (disks

9), so that supporting profiles 1 or 1' can be mounted in an articulated manner on supporting profiles 1a, 1a'.

Figure 9 shows an arrangement in which two supporting profiles 1 with a round cross-section are fastened in a horizontally aligned manner on a vertically aligned supporting profile 1 in known fashion. A turnbuckle is inserted into the rectangular center chamber 23 of the adapter piece 3 (Figure 4). The turnbuckle, as described, for example, in German Patent Document DE-U 298 21 204, is used for fastening the horizontal supporting profiles 1 to the grooves 2 of the vertical supporting profile 1. In order to avoid an unattractive wedge-shaped space between the plane faces of the horizontal supporting profile 1 and the curvature of the vertical supporting profile 1, an end disk 24, as shown in Figures 10 to 12, is provided which is constructed as a formed body with a concave curvature 25. The end disk 24 also provides a more stable joint. As illustrated in Figures 11 and 12, this end disk 24 has a central opening 26 for the turnbuckle to pass through. On both sides of this opening 26, the end disk 24 has two openings 27 through which the screws can pass through and can be screwed into the openings 7 of the adapter piece 3. In this manner, the end disk 24 can be fixedly connected with the corresponding supporting profile 1. However, it was found that such a fastening by means of screws is not absolutely necessary if the turnbuckle is slid in the above-mentioned manner into the supporting profile with the end disk 24. The reason is that the turnbuckle, which is then axially anchored in the adapter piece 3, can also interact with the opening 26 as a stop and can hold the end disk 24 on the face of a supporting profile 1 without the requirement of special fastening operations. If the supporting profile 1, which in



the embodiment shown in Figure 9 is aligned horizontally, is anchored by means of the turnbuckle in the groove 2, the concave recess 25 of the end disk 24 constructed as a formed piece are pressed firmly against the face of the supporting profile 1 and secured. Naturally, it would also be conceivable here to provide end disks 24 with a square cross-section so that supporting profiles 1a, 1a' with a square cross-section can be connected in a perpendicular manner to supporting profiles 1, 1' having a round cross-section.

Figures 10 and 12 also outline another variant. A sleeve-shaped attachment 28, illustrated by a broken line, may be part of the end disk 24 and may secure the end disk 24 on the face of the assigned supporting profile in a manner known per se by means of screws laterally introduced as shown by the dash-dotted lines 29 in Figure 10.

The construction according to the invention therefore opens up variation possibilities for combining supporting profiles which can be utilized particularly in constructions for fairs, exhibitions or stores for new structural variants.

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Applicant: Octanorm-Vertriebs-GmbH für Bauelemente

(New Claims 1 to 9)

1. Supporting profile for a system for erecting structures which is provided with longitudinally extending grooves on the outside, which grooves are used for the connection of additional supporting profiles (1, 1a) or structural parts of the construction system, the carrying profile, in the area of at least one of its open front ends, having a slid-in adapter piece (3) which is provided with a receiving chamber (23) for a turnbuckle, is inserted in guides pointing toward the interior of the supporting profile (1, 1a) and is axially held by means of securing devices which are inserted in bores penetrating the guides,

characterized in that a disk-type end piece (5, 24), which is adapted to the cross-section of the supporting profile (1, 1a), is provided for being placed on at least the open face of the supporting profile and is connected with the adapter piece (3).

2. Supporting profile according to Claim 1,

characterized in that the end piece (24) is constructed as a formed body with a concave recess (25) which is adapted to the external curvature of a round profile.

3. Supporting profile according to Claim 2,

characterized in that the formed body (24) is provided with a passage opening (26) for the guiding-through of a turnbuckle.

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4. Supporting profile according to Claim 1,

characterized in that the end piece (5, 5a) is provided with a joint part (9, 11) for the connection with additional profiles.

5. Supporting profile according to Claim 4,

characterized in that the joint part consists of a first disk (9) which extends perpendicular to the end piece (5, 5a) and has a center bore (10) and of an additional second disk (9) which is connected with the first disk (9) by means of a bolt (11) acting as an axis of rotation and which is equipped with fastening devices for another profile.

6. Supporting profile according to Claim 5,

characterized in that the second disk (9) is connected with another end piece (5, 5a).

7. Supporting profile according to Claim 5,

characterized in that the second disk 9 is provided with a clamping part (16, 17) for the insertion into one of the longitudinally extending grooves (2) of another supporting profile (1).

8. Supporting profile according to Claim 5,

characterized in that hemispheres (13) are provided for the lateral covering of the disks (9).

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9. Supporting profile according to Claim 8,

characterized in that the hemispheres (13) have a center bore (14) with a thread and, by means of this thread, are screwed onto a thread at the ends of the bolt (11) penetrating the disks (9).